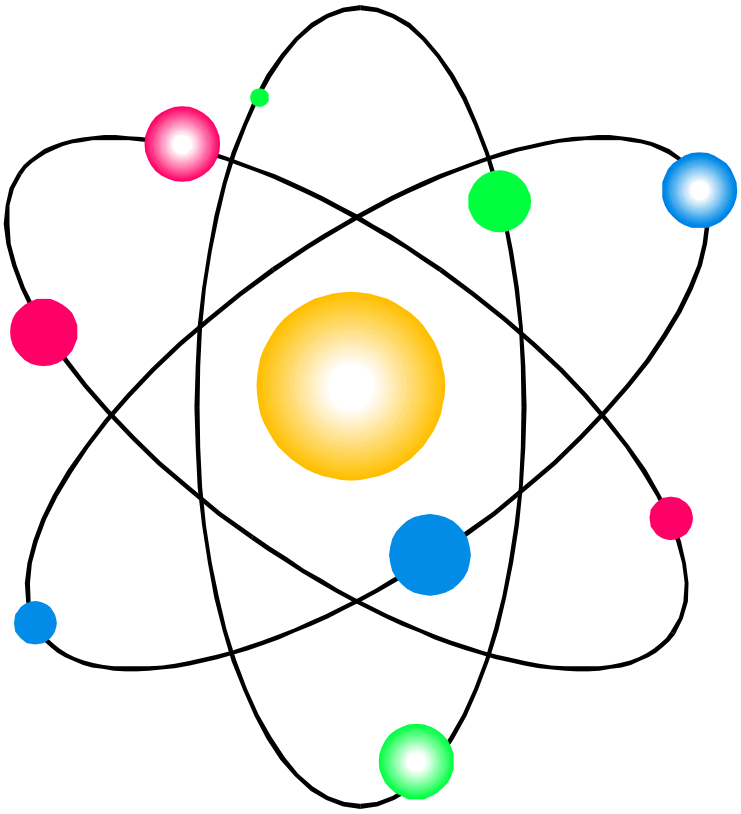
HIGH SCHOOL SCIENCE

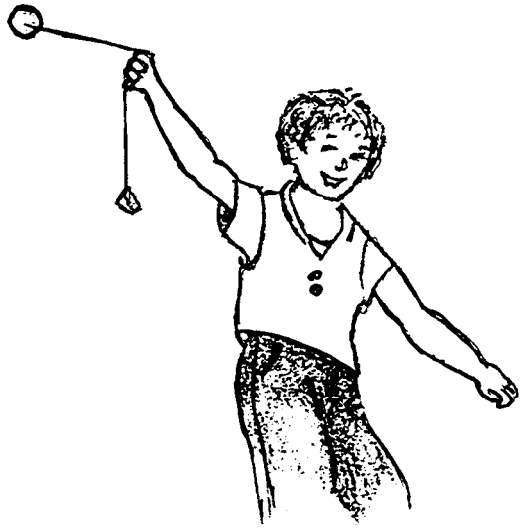
RELEASED ITEMS



Missouri Assessment Program
Spring 1998

CONSTRUCTED RESPONSE ITEMS

1. Terry is swinging a ball attached to a string that goes down a tube and supports a weight. Terry holds on to the tube, not the string. As long as Terry swings the ball at the present speed, the distance from the tube to the weight remains the same.



(a) Look at the drawing. Identify three forces acting on the ball at the end of the string.

1. _____

2. _____

3. _____

(b) If all these forces suddenly stopped acting on the ball, what would happen to the motion of the ball?

_____

2. While studying clovers, a botanist noticed a clover that had a newly mutated gene. This gene allowed the plant to absorb more nutrients from the soil, thus providing an advantage over other clovers in the population that did not have the new gene.

Over time, what will happen to the frequency of this gene in the gene pool?

Explain your answer.

3. Explain how waste that is deposited in a landfill can contaminate nearby water sources.

4. It was once believed. that the fevers of malaria were caused by the night air. Some walled cities shot off gunpowder or burned sulfur to keep out the bad air.

Using present scientific knowledge about malaria and/or yellow fever, explain why shooting off gunpowder and burning sulfur will not reduce anyone's chances of getting malaria.

Explain why malaria-prevention programs have not been needed in the state of Missouri.

5. According to theory, what was a necessary condition for our sun to be formed from a cloud of hydrogen gas?

Once our sun formed, what was one element it began to produce?

Our sun is now a medium-sized and middle-aged star. Name a stage our sun may go through as it continues to evolve.

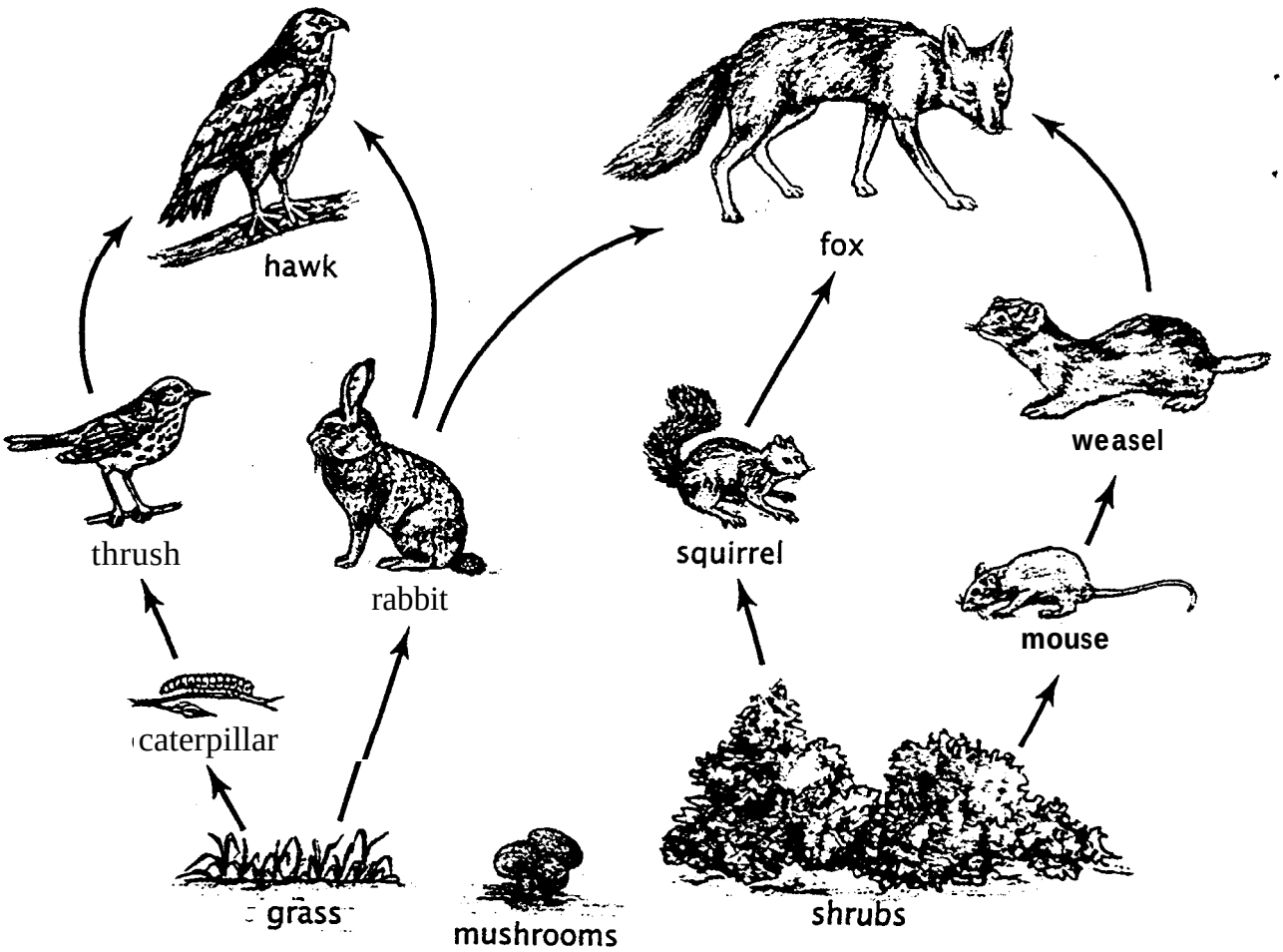
A 100g ice cube was added to a beaker containing 200g of warm water. The ice cube was allowed to melt in the water. Use this information to help you answer Number 27.

6.

(a) Describe the direction of energy flow while the ice is melting.

(b) Describe how the molecules of warm water interact with the molecules of ice to melt the ice.

An ecologist works in a state park that contains this food web.



7. One season the thrush population was killed by a parasite. This caused the caterpillar population to explode and eat all the grass.

Describe a chain of at least three events by which this depletion of grass could result in the increase of the mouse population.

8. A cyclist travels down the street and the following data are obtained.

Distance (m)	Time (sec)
0	0
5	1
10	2
15	3
20	4
25	5

Is the cyclist accelerating or traveling at a constant speed? Explain your answer.

Explain what the cyclist could do to both maintain constant speed **and** accelerate at the same time.

PERFORMANCE EVENT ITEM

Small Fry

After a two-day fishing tournament at a local lake, it was observed that in one cove the bass caught were of an unusually small mass. A large manufacturing plant was releasing hot water into the lake at this point. A group of high school ecology students wanted to know if there was a relationship between the water temperature, the mass of the fish, and the amount of dissolved oxygen present in the organisms' environment. The students set up four aquariums and stocked each with 3 bass.

1 Name three variables that must be kept constant in the experiment so that the data will tell the students what they want to know.

1. _____

_____

_____

2 As shown in the table below, the students used different temperature settings for each aquarium. When they began the experiment, the fish were all the same mass. After two months, the fish were weighed and oxygen levels in each aquarium were measured. The results are shown in the table below.

Aquarium	Temperature (°C)	Average Mass of Fish (g)	Dissolved Oxygen (ppm)
1	23	162	8
2	25	121	7
3	27	102	6
4	29	94	5

Summarize the results of the students' investigation.

_____

_____

_____

_____

3 The manufacturing plant makes products that are useful in your community and provides jobs for many people. Five proposals are being considered by the city:

1. Shut the plant down.
2. Move the plant away from the lake.
3. Require the plant to adopt new (but expensive) technology to cool the water before it enters the cove.
4. Require the plant to load the water into tanks and haul it off to be dumped into a stream away from the lake.
5. Take no action since no fish are being killed as far as anyone can tell.

Which one of these proposals would you recommend based on the results of the students' investigation?

_____

Justify your answer by describing two advantages and one disadvantage of that proposal.

advantage 1: _____

_____

advantage 2: _____

_____

disadvantage: _____

_____

On the lines below, discuss why you think the two advantages you listed outweigh the disadvantage.

discussion: _____

_____

_____

_____

_____